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TURKEY RAISING



THE BUSINESS OF TURKEY RAISING, where conditions are suitable, is quite profitable. It is usually carried on as a side line on general farms, though in some parts of the United States it constitutes the chief source of revenue from farming operations.

The number of turkeys in this country decreased for a time after the 1890 census but during recent years the industry has been on the upgrade, largely because of improved methods of controlling turkey diseases and better methods of management.

This bulletin has been prepared primarily to bring to the attention of those interested in turkey raising information on modern methods of management. Most of the recommendations are adaptable to both small and large scale production.

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TURKEY RAISING

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THE TURKEY INDUSTRY OF THE UNITED STATES

TURKEY RAISING in the United States has long been an important enterprise because great quantities of turkey meat are required annually and its use throughout the year is becoming more popular. Since there is always likely to be a keen demand for such a popular article of diet, it is desirable to encourage raising turkeys in adequate numbers. Producers should endeavor to make turkey raising more profitable by overcoming heavy losses from diseases that heretofore have been a serious handicap.

The enterprise is very adaptable, extending to practically all parts of the United States. The more important areas of production are the Middle Western, Northwestern, and Southwestern States, where large numbers of small flocks are raised annually on farms and ranches and there are also many large commercial flocks. The number of turkeys in this country began to decrease about 1890 but by 1910 interest in turkey raising revived and the industry has since been on the upgrade, largely because of increased knowledge of black-head disease and its control.

According to the census there were 3,688,000 turkeys on farms in the United States in 1910 and about the same number in 1920. The 1930 census showed 16,794,000 turkeys but this was the number raised to market age instead of breeding turkeys kept. This new census figure provides a much better measure of the industry's actual size. The 1930 figure indicates a moderate increase between 1920 and 1930 in the number of breeding turkeys kept. The nine leading States in turkey production as shown by the 1930 census are Texas, North Dakota, Minnesota, California, Oklahoma, Oregon, Colorado, Virginia, and Idaho.

Several causes have been assigned for the decrease in the number raised. Rearing the young stock, in some respects at least,

requires more detailed attention than in the case of most other classes of poultry. The prevalence of blackhead has been a dominant factor. The birds range widely and frequently trespass upon the property of neighbors, the vexation tending to discourage turkey raising. Finally, little attention has been given the more important problems of the industry by investigators and others interested.

On the other hand, there is good opportunity for further development. Turkey raising is profitable, particularly where conditions are suitable and proper methods of management are followed. Turkeys



FIGURE 1.—Bronze turkey, male

can be raised successfully under very simple conditions, so that the capital outlay in the enterprise is quite small. Except during the growing season, the management of the flock is a fairly simple matter. Of course, considerable care must be exercised in maintaining constitutional vigor in the breeding stock; the flock must be kept relatively free from disease; and the soil, especially where the poults are fed, must be kept sanitary. But these factors can be dealt with when proper care is exercised. Moreover, turkeys are inclined to range freely, and in doing so they destroy many injurious insects and pick up

much waste grain. This reduces the costs of raising and increases the profits. Prices for live and dressed turkeys have always been considerably higher than those for other classes of poultry.

VARIETIES

All domestic varieties have descended from wild stocks, comprising four varieties: The eastern wild turkey, which ranged over the eastern part of the United States from Maine to Florida; the Florida wild turkey, which ranged over southern Florida; the Rio Grande wild turkey, which ranged over southern Texas and northwestern Mexico; and the Mexican wild turkey, which ranged over Arizona, western New Mexico, southern Colorado, and Mexico. It is probable, however, that these four wild varieties were of common origin and that most of our domesticated varieties, especially the Bronze, have descended from the Mexican wild variety.

There are six varieties of domestic turkeys. These are recognized as standard varieties by the American Poultry Association, an as-

sociation which has as its primary function the promotion of standard qualities in all breeds and varieties of poultry in America. The association publishes the "Standard of Perfection," which contains a concise description of breeds and varieties of poultry and numerous illustrations of the more important. Following is a brief description of each of the six varieties, which include the Bronze, White Holland, Bourbon Red, Black, Narragansett, and Slate.

THE BRONZE

In color the Bronze male (fig. 1) is distinguished by the rich, brilliant copperish sheen of plumage in neck, wing bows and wing coverts, breast, back, body, and fluff, against a background of black and brown. The white barring of the wings and the wide, pure-white edging of the main tail feathers and tail coverts make a strong contrast to the body color. The body color blends into an equally dark fluff with a wide brilliant bronze band extending across it and tipped with a narrow edging of white. The lighter, more brilliant bronze barring of the feathers of the neck, breast, wing bows, and wing coverts terminates in a narrow black band or bar extending across the end of each feather. The plumage of the female (fig. 2) is similar to that of the male, except for an edging of white on the black bars in these sections and in the feathers of the back.



FIGURE 2.—Bronze turkey hen

This white edging is narrow in the front of the body and gradually widens as it approaches the rear. Both sexes have the same color pattern in the main tail feathers and coverts, with brown barring on a dull black background. Each main tail feather and covert has a wide edging. Creaminess, yellow, or yellowish brown in the pure white edging of the main tail feathers and coverts of the Bronze indicates an admixture of wild-turkey blood.

THE WHITE HOLLAND

The White Holland (fig. 3) probably originated as a "sport" from the Bronze or the wild turkey. Its plumage should be pure white in color and free from black flecking or ticking in all sections. The shanks and toes in this variety vary from white to pinkish white.

THE BOURBON RED

The Bourbon Red (fig. 4) is a rich, deep brownish red in all sections except the primaries and secondaries of the wings and the main tail feathers, which should be pure white. More than one-fourth red in the wings or tail constitutes a standard disqualification in this variety. The rich reddish color is rather difficult to obtain

without some black, and this black ticking or flecking is a rather common fault. A faded red approaching buff is also undesirable. The color of the female is similar to that of the male, but, as in the other parti-colored breeds, the female is slightly lighter in color and has a narrow edging of white on breast, body, and thighs.

THE BLACK

The Black turkey (fig. 5), known in England as the Norfolk turkey, has solid black color with a lustrous greenish-black surface in all sections. Objectionable white tipping in the feathers of young turkeys of this variety often disappears after the first molt. Any variation from the solid

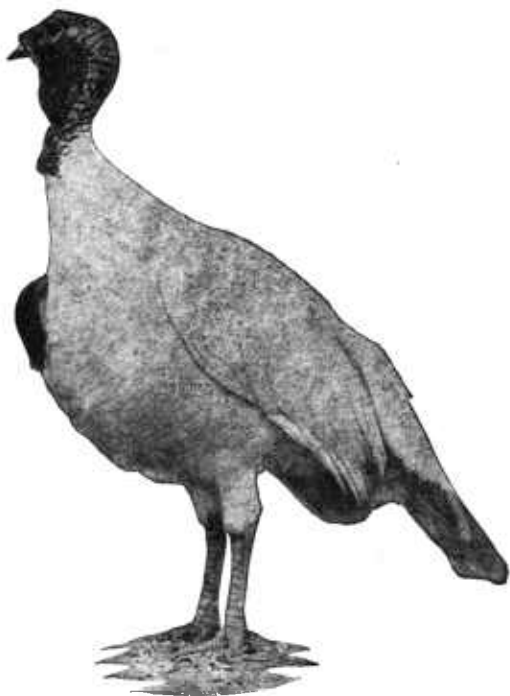


FIGURE 3.—White Holland turkey, male

black color, whether in brown or bronze shading, should be carefully avoided in breeding this variety.

THE NARRAGANSETT

The Narragansett turkey (fig. 6) has a general resemblance in color pattern to the Bronze, but in contrast to the bronze barring narrowly edged with black, the Narragansett has metallic black and light steel-gray edging and barring. It has a dark background of metallic black and a broad white edging, showing more black in its edging as the body is approached. The general effect is much lighter in the Narragansett, however, on account of the whiteness or steel-gray color in the black body plumage, the white wing band, and white edging of main tail feathers and coverts. In all these sections the light steel-gray or white edging terminates in a black band.

The female plumage is similar to that of the male in this variety, although it shows more whiteness or light steel-gray color in the back, and the ends of the feathers in other sections terminate in an edging of light gray, approaching white. In the female, as in the male, the primaries and secondaries are evenly and distinctly barred with

black and white or light gray. The female in general presents a lighter appearance than the male. There should be a rich metallic black but no bronze barring in the females. The offspring of a Narragansett mating, however, sometimes show bronze color, but such birds should not be bred.

THE SLATE

The Slate turkey (fig. 7) has an ashy-blue or slaty-colored plumage, sometimes dotted with tiny black spots. The less of this black the better, and any other foreign color, such as white, buff, or red, is undesirable. This variety does not breed very true to color and many of the offspring show both solid white and black as well as black and white ticking and splashing. This variety has dark lead or slaty-blue shanks and toes.

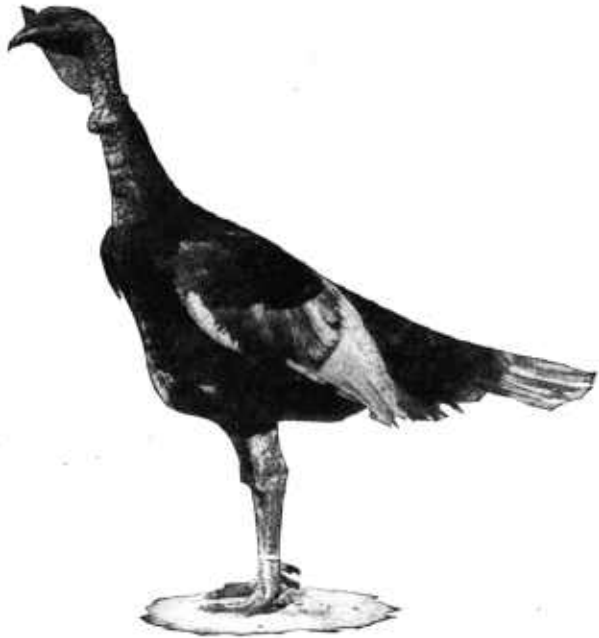


FIGURE 4.—Bourbon Red turkey, male

STANDARD WEIGHTS OF TURKEYS

Until the sex can be distinguished the young of domestic turkeys are called "poults"; thereafter, up to 1 year of age, young birds are called cockerels and pullets. Birds over 1 year old are called cocks and hens.

The standard weights of the different varieties of turkeys as given in the Standard of Perfection are as follows:

Standard weights of turkeys at various ages

Varlety	Adult cock (2 years old or over)	Yearling cock (1 year old and less than 2)	Cockerel (less than 1 year old)	Hen (1 year old or over)	Pullet (less than 1 year old)
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Bronze	36	33	25	20	16
Bourbon Red	33	30	23	18	14
Narragansett	33	30	23	18	14
White Holland	33	30	23	18	14
Black	33	30	23	18	14
Slate	33	30	23	18	14

SELECTING BREEDING STOCK

The Bronze turkey is the heaviest, and is probably more popular throughout the country than the other varieties. Since turkeys

are sold by weight, the heaviest birds bring the largest returns. Regarding other characteristics, it is quite generally asserted that the Bronze is the hardiest variety, that the Bourbon Red and White Holland are the most domestic, and that the White Holland is the most prolific. These qualities are possessed in different degrees by individuals of every variety, however, and can be developed by proper management and careful selection of breeding stock.

The most satisfactory time of the year to select breeding stock is in November or December, especially before large numbers are sold for the Thanksgiving and Christmas markets. Selecting birds early in the season gives one a choice from a larger number, and, more important still, the best-developed birds can be saved for breeding

instead of being marketed. New blood may be introduced into the flock or a start may be made with turkeys by purchasing hatching eggs instead of purchasing breeding stock. The purchasing of breeding stock, however, is recommended.

Turkeys are raised for meat rather than for egg production. The breeders should possess bodies well adapted for meat production. This means that they should have good, large frames. The back should be broad, especially at the shoulders, and the breadth should be carried well back toward the tail. The body



FIGURE 5.—Black turkey, male

should be deep, with a full, well-rounded breast. Other points of importance include a full, bright eye, a broad head, stout legs set well apart and not too long. Above all else, be sure to select vigorous birds. This is of paramount importance and should never be overlooked.

Select or build up a flock of purebred turkeys, for they are more profitable than mongrels or crossbreds. Also, it is eminently desirable to maintain the flock up to standard qualities as far as possible. It costs no more to raise purebred stock than crossbreds or mongrels and the purebreds are usually heavier and command higher market prices. Then, again, where good standard qualities in respect to shape and color are maintained some of the birds can be sold for breeding purposes at increased prices.

MANAGEMENT OF BREEDING STOCK

Results in turkey raising depend to a large extent on the kind of breeding stock used each year and the manner in which it is managed. The breeding stock is the foundation of the turkey industry, and the greatest care must be used in selecting both male and female breeders. Failure in this respect has undoubtedly been one of the principal reasons why satisfactory results have not been obtained on many farms and commercial plants. One of the first steps in improving conditions, therefore, is more careful selection of the breeding stock.

PROTECTION FROM WEATHER

Under ordinary conditions turkeys do not require much protection from the weather. During winter weather in the Northern States, however, it is well to provide covered roosting sheds. In the southern part of the United States there is little need for a regular turkey house, but during damp and cold or stormy weather the turkeys should have protection of some kind. They should not be exposed to dampness, but they can stand considerable dry cold.



FIGURE 6.—Narragansett turkey, male

BREEDING PENS OR INCLOSURES

It has been the usual custom to allow the breeding flock free range throughout the breeding and laying season. (Fig. 8.) This seems to give satisfactory results provided the nests can readily be found so that the eggs can be gathered daily. In recent years a large number of breeding flocks have been kept in breeding pens or inclosures with conveniently located nests. (Fig. 9.) The pens should be of sufficient size to afford plenty of exercise, a flock of 15 birds requiring about 1 acre. The pen need be only a very simple affair. Frequently the orchard serves this purpose very satisfactorily. A hog-proof fence about 4 feet high is enough to confine the turkeys; they are not inclined to fly over the fence, because they can not rest on the top wire. If board or rail fences are used, they should be of

fairly good height with strands of wire above the top to prevent the turkeys from perching on the fence. If turkeys persist in flying over any kind of fence the flight feathers of one wing may be cut; or a small piece of light board may be fastened across the back by notching the board and tying it with a strip of cloth to each wing (fig. 10), so that when the wings are raised they strike against the board and prevent flying.

FEEDING THE BREEDING STOCK

Feeding the breeding stock is a simple matter. It is important to keep the breeders in good condition, however, and they should be well fed but not overfed.



FIGURE 7.—Slate turkey, male

Where turkeys have plenty of free range they should obtain an ample supply of insects, green feed, and seeds, but it is also advisable to give them a daily feed of grain, such as a ration of equal parts of oats, wheat, and corn. Considerable care should be taken to see that the grain fed, particularly the corn, is clean and wholesome. During the cold winter months, especially in the northern part of the country, grain should usually be fed twice a day. Care should be taken not to feed too much corn and if that is the only whole grain available, mash should also be fed. Alfalfa or clover hay should be fed in

the winter or if not available cabbages or mangels may be used. Milk is very desirable to use with the whole grains and if no milk is available a laying mash may be used throughout the winter. Feed regularly and be careful not to overfeed, especially corn, and change the place of feeding frequently. The breeders should also have liberal supplies of grit and oyster shell.

MATING

Best results from the standpoint of mating are obtained when from 10 to 12 females are mated to a healthy, vigorous "tom," or male bird. If more hens are kept more males should be used, but great care should be taken not to allow two toms to run together.

When from 20 to 25 hens are kept the toms used should be alternated every other day. The proportion of hens to one tom used in mating gives a good idea of the relative importance of the male bird.



FIGURE 8.—Breeding flock of Bronze turkeys on free range

His selection from the standpoint of type and constitutional vigor is a very important matter, although the females should also be kept up to standard as far as possible. The aim should be, in making up a breeding pen, to choose birds of standard weight. (See table on p. 5.)

Concerning the age of the birds to be used as breeders, most breeders prefer to mate a vigorous, well-grown tom (cockerel) with yearling



FIGURE 9.—Breeding and laying pen inclosed by a hog-proof wire fence

hens or sometimes with early hatched pullets. If pullets are used they should be well matured, as there is great danger of lowering the vitality of the stock by using immature birds. Yearling and older

toms can be used if desired, but sometimes there is danger of their excessive weight causing injury. At any rate, if a yearling or older tom is used, his spurs and nails should be trimmed. With respect to



FIGURE 10.—Device preventing turkeys from flying over fence

females, since egg production decreases materially after three years, it is advisable to replace 3-year-old females with young birds.

It is not advisable to inbreed turkeys, as it has been found in many cases to result in a great lowering of the vitality of the stock. It is well to get new blood by purchasing male stock from an outside source. Great care should be used in selecting males from reliable breeders whose stock is first of all healthy and vigorous,

approaches standard weight, and possesses other standard qualities to a high degree.

EGG PRODUCTION

The time of year when turkeys naturally lay depends largely on the climate of the region in which they are raised, being earliest in the South. Any egg mash such as is used for chicken hens should

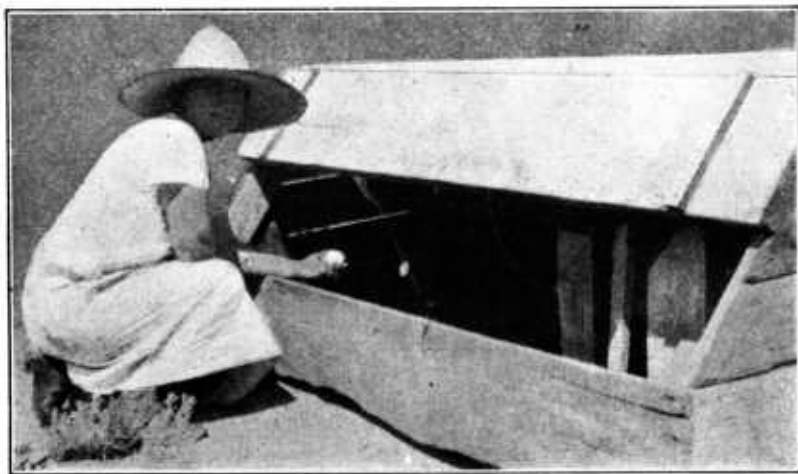


FIGURE 11.—Collecting an egg from a turkey trap nest

be fed one month before eggs are desired for hatching. A good mash may be made of 2 parts, by weight, of wheat bran, middlings, ground oats, ground corn and meat scraps, and 1 part of alfalfa-leaf meal. If milk is used the meat scraps may be reduced to 1 part. Add 3 pounds of bone meal and 1 pound of salt to every 100 pounds of mash and keep oyster shells and grit always available. Soon after mating

begins, the female looks for a nesting place, and about 10 days after the first mating she commences to lay. Naturally, all the hens do not begin laying at the same time, and in a flock of about 15 the time of commencement may be spread over a period of six weeks. The number of eggs produced per bird depends on the breeding of the stock as well as on the management. Under ordinary circumstances, however, the average number of eggs per bird is about 20 in the first litter. Turkeys lay in litters; that is, they will lay about 20 eggs, and then go broody; and after getting over their brooding period they will lay a second or a third lot, each subsequent litter containing fewer eggs. Some hens can be made to lay more than three litters. It is not well, however, to try to hatch the eggs of the late litters, as late-hatched turkeys are very rarely profitable.

Very little information is available on trap nesting, but the practice is being carried out in a limited way by breeders who wish to pedigree the poults from certain matings. A simple form of a trap-nest coop is illustrated in Figure 11. The turkey enters through a door at the end, which closes automatically when the turkey is

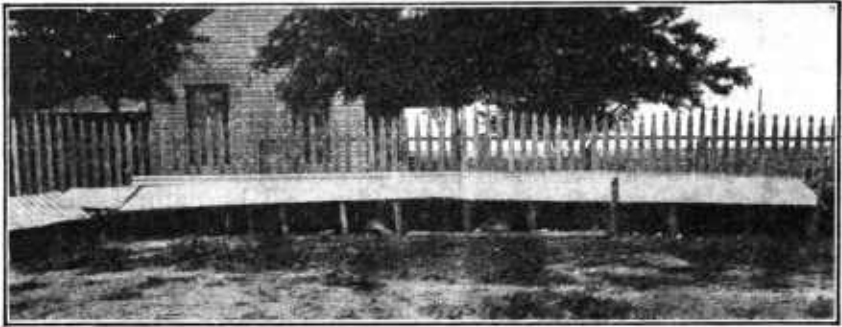


FIGURE 12.—Long row of nests used by large turkey raisers for setting turkey hens

inside. A larger door of the coop is shown in the illustration which is opened to release the turkey from the nest.

Where incubators are used to hatch the turkey eggs of the first litter, the turkey hen can be broken up from her broodiness and she will immediately begin to lay a second litter. This method of getting the turkey to lay her second litter shortly after the first one is very desirable, as it provides for the hatching of a relatively large number of early turkeys. The early hatched birds are the ones that grow and mature most satisfactorily, and therefore attain the best size for the Thanksgiving and Christmas markets.

Turkeys have not been so completely domesticated as have chickens, and it is natural, therefore, for the turkey hen to seek a secluded place in which to lay. One must be on the lookout for hidden nests; otherwise eggs may not be collected regularly and they may become chilled or destroyed by predatory animals. Sometimes the hidden nest can be found by observing the turkey hen carefully as she makes her way to the nest, but a much easier and quicker method is to confine the hens early some morning soon after they come from the roost and then let them out late in the afternoon; the hens that are laying will make straight for their nests in order

to lay the eggs they have been holding. Sometimes turkeys will take to nests provided for them, and whenever this is done a great deal of trouble is saved. Nests are easily made of boxes or barrels placed so as to be protected from animals.

INCUBATING TURKEY EGGS

The vigor of the breeding stock, the manner in which it has been managed, and the care given the eggs will determine in large degree the quality of the hatching eggs. In a large measure, the criterion of success in turkey raising is the number of fully matured turkeys raised in proportion to the number of hens in the breeding flock. An average of from 10 to 15 mature birds raised for each hen is considered very good but instances of 25 birds per hen are on record.

The eggs should be collected regularly every day and kept in a room at a temperature of from 50° to 60° F. They should be turned every day, but should be handled carefully and for best results should not be kept longer than a week or 10 days.

The period of incubation of turkey eggs is 28 days, and the method of incubation is much the same as with chickens. Three common methods are used: (1) Hatch eggs in incubator and brood under hovers; (2) hatch eggs in incubator and brood with turkey hens; (3) allow a turkey hen to hatch the eggs and raise the poults. The hatching and rearing of turkeys under chicken hens is not advised.

The first method, which is the best, is coming into more general use, especially on farms and ranches where turkeys are raised in large numbers. Turkeys hatched and reared by natural methods, especially where chicken hens are used, are likely to contract disease. Turkey hens, in sitting, can cover from 15 to 18 eggs.

When the turkey hen becomes broody she should be allowed to sit on the nest for two or three days before being intrusted with the eggs. When she has remained consistently on the nest for two or three days she should be given her eggs and attended to as suggested. If several turkey hens are sitting at the same time care should be taken to see that they get back to the nests properly and that no nest is left uncovered. Nests are most conveniently arranged on the ground or in boxes or barrels and should be covered so that the turkey hens will not be disturbed. (Figs. 12 and 13.) At the same time the turkey hens should be taken off daily and allowed to exercise and should be given plenty of water to drink and clean, wholesome feed, such as a mixture of wheat, oats, and corn.

Turkey hens, while sitting on turkey eggs, should be dusted with sodium fluoride as directed on page 21. This powder will tend to rid the sitting birds of body lice which would otherwise annoy them and, more important, keep the lice from getting started on the young birds.

Hatching turkey eggs in incubators is much the same as in the incubation of hens' eggs. Incubation temperatures are about the same as for hens' eggs or slightly lower. However, this is affected by the relative position of the thermometer. With the thermometer just clearing the eggs the temperature is begun at 101° or 101½° F. and gradually increased to 102½° or 103° F. by hatching time. The eggs should be turned two or three times daily and should be tested on the tenth and twentieth days, removing all infertile eggs and those

having dead germs. On the twenty-sixth day the incubator door should be darkened and kept closed until hatching is completed. The poults are then left in the nursery trays in the incubators for from 24 to 36 hours.

The successful shipping of day-old poults in specially built straw-board boxes has been fully demonstrated. The container is larger than that ordinarily used for baby chicks, 60 poults being placed in each box.

REARING THE POULTS

There are few problems in turkey raising so important as brooding and rearing the poults, because the greatest losses in turkey raising occur in about the first five weeks after the poults are hatched. Heavy mortality among the poults indicates that the breeding stock used was low in vitality or was poorly managed. The importance of keeping both the poults and the breeding turkeys on ground free from any infection and away from chickens can not be overemphasized. The poults should be raised separately from the chickens and the turkey breeders kept separate from the other poultry on the farm. Improper methods of brooding will do a great deal of harm, of course, because turkeys can not stand any great amount of dampness. They must be kept comfortable and fed properly; otherwise the digestive system may be so affected that disease will gain control.

BROODING

The poults may be brooded either by artificial brooders or by turkey hens. The artificial method of brooding makes it easier to maintain proper sanitation, serves to keep down costs, and puts the poults more directly under the control of the operator. Brooding by turkey hens has the advantage of allowing the poults to be raised in small flocks and of readily providing free range conditions. There are disadvantages, however, especially as the young turkeys may contract disease and parasite infection from the hens, and they may wander too far, and some of the poults may be lost through storms or by predatory animals.

Brooding the poults by turkey hens is not a difficult matter, although there are several details which should always receive careful attention. As soon as the hatch is completed and the poults begin to run out from under the sitting hen, the hen and her brood should be transferred to a coop. A coop of simple design, such as the A-shaped (fig. 13), large enough to comfortably accommodate either a chicken or a turkey hen, and well built to protect the brood against the rains, is all that is required. It should be about 5 feet long, 3 feet wide, and 3 feet high. Each hen should have a separate coop, and where there are several broods the coops should be placed some distance apart on well-drained soil where the grass is fairly short. For the first day or so it is well to confine the poults in the coop with the mother hen. Then make a small yard, using boards or wire, around the front of the coop and allow the poults to run in and out at will. Exercise is very important, but the young poults should not be allowed to run in long, wet grass, and during a heavy rain they should be confined in the coop. The coop should be moved to fresh

ground every other day and should be thoroughly cleaned and disinfected frequently. When the poults are about a week old the mother hen may be allowed to roam with her brood, but care should be taken to see that the entire brood returns in the evening and is protected at night from predatory animals. Good results may be obtained by keeping the mother hens confined and allowing the poults to range. It is especially important that the brood be properly sheltered during rainstorms or damp weather, as dampness and cold are highly fatal to the poults. The poults may be kept with the mother hen for a long time, but better results are usually obtained by moving the poults to a separate rearing field when they are from 8 to 12 weeks old.

The practice of brooding poults artificially is becoming more prevalent and is usually more successful than brooding with turkey hens.

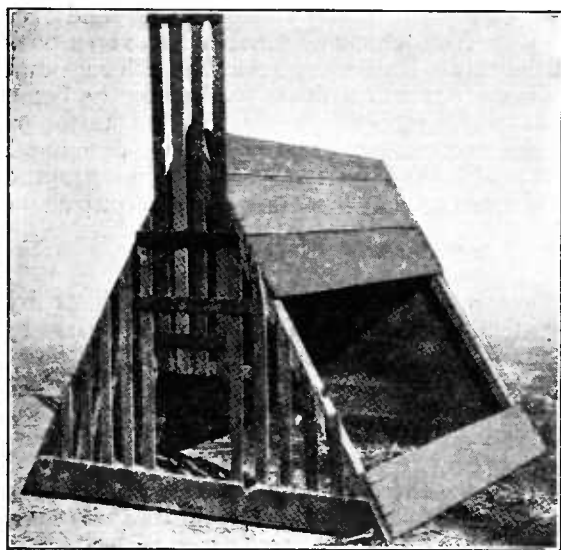


FIGURE 13.—A well-built brood coop which can be used either for setting a turkey hen or for raising a brood of poults

The methods used in artificial brooding are very similar to those used for raising chicks. Between 75 and 125 poults should be placed under one 52-inch hover. The prevailing custom is to use brooder stoves, which are placed in portable colony houses. The houses are moved frequently, thereby giving the poults plenty of free range on clean soil. Since the dreaded blackhead disease is closely associated with insanitary conditions, special emphasis must be placed on keeping the houses, runs, and

yards clean. Where permanent brooder houses are used a slab of concrete from 12 to 14 feet wide is often used in front of the house. For portable houses the ground may be covered with coarse sand or gravel and this material raked frequently while the poults are confined to the small area. A board platform or a skeleton framework covered with $\frac{1}{2}$ -inch mesh wire may be used. Poults have been confined to this wire platform for as long as eight weeks.

In Minnesota a successful system of ranging poults around the colony house has been devised. The house is built with a small opening in each side and a portable fence or hurdle is constructed so that each side can be used as an outside run. The birds are ranged to the south for from five to seven days, then the house is thoroughly cleaned and the range changed to the west, and so on till all four yards have been utilized. The brooder house is then moved to a clean spot and

the rotation repeated. In using this semiconfinement method the poults are allowed free range after they are from 8 to 12 weeks old. The question of clean range is of paramount importance, clean range being defined as ground where turkeys or chickens had not ranged the preceding year and where poultry manure has not been spread.

The general conditions of managing the poults are much the same as when hens are used for brooding. One point of great importance, however, in brooding poults artificially, is to make sure that they do not crowd together while in the brooder house. This is avoided by keeping an even temperature and providing good ventilation. A dim light hung above the hover at night seems to have a quieting effect on the poults. When the poults are first put into the colony house with the brooder stove the temperature under the hover should be about 98° F. 3 inches above the floor. Depending on the season, this temperature should be lowered gradually until the poults are about 10 weeks old, when they require but very little heat, especially in the daytime. Low, flat roosts should be placed in the brooder house when the poults are from 3 to 4 weeks old to encourage the turkeys to begin roosting at an early age. The front roost should be 6 inches above the floor and the other roosts may be on the same level or each higher than the one in front. A crude roost of posts and poles 6 to 8 feet from the ground may be provided on the growing range, inclosed by a wire fence to keep predatory animals out.

DEVELOPMENT AND SEX

The poults, when first hatched, are covered with soft down. Very soon, however, wing feathers begin to develop, and at 2 weeks of age they are long enough to cover the back, sides, and rump. When the poults are about 10 days old, feathers begin to appear where the wings join the body and in about three weeks the tail feathers begin to appear. From then on feather growth is quite rapid, and when the poults are 2 months old they are well feathered.

The head and upper part of the neck of mature turkeys are red and covered with fleshy caruncles. The development of this condition is of some significance in the poults. Up to about 4 weeks of age there is no trace of red on the heads or necks. Then about the fifth week the caruncles begin to appear and by the seventh week they begin to extend down the neck. The appearance of caruncles in the poults is termed "shooting the red." On the top of the head in both males and females the fleshy protuberance develops into what is called the "dew bill," and in males it is larger and more elastic than in females.

The sex of poults can be distinguished at a relatively early age by the earlier appearance of a tuft of hairs on the breast of males. The appearance of this tuft is preceded by the growth of a small, fleshy protuberance. The tuft first appears on males when they are between 3 and 4 months old, but it does not appear on the breast of females until they are about 1 year old. Then, again, the hairs of the tuft on males are much longer and coarser than those on females.

Another point of difference between adult males and females is the presence of a spur in males and its absence in females. In cockerels, or toms under 1 year of age, there appears on the inside

of each shank a blunt, horny structure. As the birds grow older this develops into a stout spur. In females this horny structure remains only a rudimentary spur.

When turkeys are raised in considerable numbers, it is a good plan to adopt some system of marking them. This practice enables one to keep track of the different broods according to age and is of assistance in the selection of early hatched birds for subsequent breeding purposes. Also, the poults from special matings may be separated from the rest of the flock or from turkeys belonging to neighbors. The poults may be marked by clipping the toes or by punching holes in the webs between the toes. Different webs may be punched for different broods and in that way an accurate record can be kept of all turkeys raised from different matings. The poults may also be marked by using wing bands, as in banding baby chicks. Turkeys may be tattooed in the wing for identification in case they are stolen or stray away with other flocks. When the turkeys approach maturity, permanent leg bands should be used if the turkeys were not marked at birth.

FEEDING

The feeding of the poults is a very important matter, not only from the standpoint of the kinds of feed given but also the manner in which they are fed. Unwholesome feeds and improper methods of feeding, especially if the poults are closely confined, have resulted in many failures in turkey raising. Much difficulty is often experienced in getting artificially brooded poults to eat. Dipping the beaks of backward poults in milk or feeding bright, shiny grit helps to induce them to eat. A young poult is much less active than a chick. Poults kept under free-range conditions are less liable to suffer from improper methods of feeding. The same rations and methods of feeding used for baby chicks are often used for raising young turkeys. There are also many special mixtures advised for turkey raising. Milk in some form is very desirable in their feed. After the poults are from 6 to 8 weeks old they may get much of their living from a good range, but the use of additional feed, both scratch and mash, will give better growth and result in early maturity and greater return above feed cost. It is a good practice to feed the poults regularly every night and in a short time they will return nightly to their proper roosting quarters.

While confined to the coop the turkey hen should be given green feed and fed twice a day on a mixture of grain, such as equal parts of corn, wheat, and oats, while water and grit should be kept before her all the time. In feeding the hen and poults, it is advisable to feed the latter outside the coop and the former inside, in order to prevent her from eating the feed intended for the poults. It is seldom necessary to keep the poults confined for more than a few days at a time and the sooner they can be given free range the better. Whether they should be put into the coop at night after ranging during the day depends on the weather and the danger from predatory animals.

For the first two days after hatching, poults require no feed, the yolk of the egg which they absorb before hatching being sufficient to maintain them for that length of time. Access to clean drinking

water and a little coarse sand and green feed to peck at is all that is needed until the third day. Beginning with the third day the poults should be fed but should always be kept more or less hungry. Furthermore, the feed should never be allowed to become moldy. Feed the poults in troughs or hoppers that can be kept sanitary. When natural feed is scarce, or when the poults are confined, they should be fed lightly about five times a day. If allowed to run outside the coop where they can find insects, seeds, and green feed, they need not be fed oftener than three times a day.

Several combinations of feeds are used by different turkey raisers. The methods of feeding some of these combinations are briefly as follows:

Hard-boiled egg, with the shell on, chopped fine and mixed with chopped green feed for the first 10 days, then a mixture of finely cracked grains fed with milk.

Stale bread soaked in milk and squeezed dry for the first few days and then common chick rations.

A good mash for raising turkey poults which are confined may be made of 30 per cent ground corn, 25 per cent ground wheat (or bran and middlings), 20 per cent dried milk, 15 per cent rolled oats, 5 per cent alfalfa-leaf meal, 4 per cent bone meal, 1 per cent salt. This mash may be used from the start by adding 2 per cent cod-liver oil. If plenty of liquid milk is used the dried milk may be omitted from this ration or 10 per cent meat scrap may be fed and the ration supplemented with milk.

Milk, especially buttermilk, is excellent for young poults. Buttermilk seems to be especially beneficial in bringing the poults successfully through the early stages. A good plan is to keep the milk in front of the poults during the morning and water during the afternoon.

If green feed and grit can not be picked up outside the coop, they must be provided in some other way. Chopped alfalfa, onion tops, and lettuce leaves make excellent green feed. Grit can be furnished in the form of coarse sand for poults and limestone grits used for the growing stock. The poults should be put out on the rearing ground when they are from 8 to 12 weeks old. An alfalfa field is ideal for this purpose and may be used either as an open range or divided into four sections and the turkey poults moved to a new section every month. The grain should not be fed on the ground but given in hoppers or troughs, which should be moved frequently. It is very important that the drinking water be fresh and clean and that the growing turkeys be kept away from stagnant-water pools.

During the summer and early fall turkeys can find much feed on the average farm. Grasshoppers and other insects, weed and grass seeds, green vegetation, berries, and grain picked up in the fields go to make up the turkey's ration. When this natural feed is plentiful very little needs to be added until fattening time, except for the purpose of bringing the turkeys home to roost every night and to keep them from straying from home. For this purpose one feed of grain every night just before roosting time is sufficient. The quantity of feed required by growing turkeys and their rate of gain is materially affected by the management. Turkeys which are well fed will gain about 1.1 per cent daily from birth to 3 months of age, reaching about 12.5 pounds at 6 months. From 3 to 4 pounds of grain and mash per

pound of gain in weight are consumed up to three months, with turkeys on alfalfa range. More feed per pound of gain is required as the birds get older.

PREPARING TURKEYS FOR MARKET

In fattening turkeys for market an excellent plan is to begin about the first of October to feed night and morning, feeding just enough at a time so that the birds go away still a little hungry; the quantity should be gradually increased until they are given all they will clean up three times a day during the week before marketing. Some turkey raisers feed equal parts of corn, wheat, and oats during the first part of the fattening season, gradually changing to all corn as the weather becomes cooler. Many raisers, however, begin feeding heavily on corn about November 1, and since turkeys are not accustomed to such heavy feeding, the disease known as scours often results, especially if new corn is used. Old corn is a much better feed than new corn, but the old corn must be free from mustiness. Nuts of various kinds, such as chestnuts, beechnuts, and acorns, are frequently available, and make good fattening feeds.

As a general rule, turkeys which have been raised on free range can not be fattened successfully in close confinement. They may be successfully fattened, however, if confined to moderate-sized fields which are in alfalfa or contain stacks of alfalfa hay. Turkeys which have been raised under semiconfined conditions may be confined more closely for fattening and will make better gains than free-range stock fattened under these conditions.

The marketing season for turkeys is very short, from the middle of November to the latter part of December. Many turkey raisers sell their birds alive to poultry dealers, who either dress them or ship them alive to city dealers. Turkeys (undrawn) lose from 12 to 14 per cent in dressing for market.

In sections, as in Texas, where turkeys are grown in large numbers, dressing plants have been built by poultry dealers, who buy the birds alive and dress them for the various city markets. In such cases practically all the turkey raisers sell to these dealers, who often send buyers into the country to gather up a drove of several hundred birds by stopping at each farm as they pass, weighing whatever turkeys the farmer may have to sell, and adding them to those already collected. (Fig. 14.) To eliminate as much as possible the shrinkage caused by long drives, the use of trucks is becoming more prevalent. Sometimes large-sized shipping coops are constructed and at other times specially built bodies are placed on the trucks. As soon as possible after the turkeys are received at the dressing plant they are killed, dry-picked, cooled, and packed in barrels or boxes for shipment.

Farmers near the city markets often dress the turkeys and sell them direct either to the consumer or to city dealers. In some sections shortly before Thanksgiving what is known as "turkey day" is held. On the day before this event every turkey grower in the neighborhood kills and dresses his turkeys and the following morning brings them into town, where they are bid on and purchased by the buyers present. In territory adjacent to our large cities the

use of the roadside stand has become quite common for marketing both live and dressed birds.

Before being killed turkeys should be deprived of feed for about 15 hours, but given plenty of fresh, clean water in order to clean the crop and intestines of all feed. When ready to be killed, the birds should be hung up by the feet. The bird's head is held in one hand and a sharp, narrow-bladed knife is used to sever the veins in the throat by making a small cut inside the mouth on the right side of the throat, at the base of the skull. After making this cut and bleeding begins, the knife is thrust up through the groove in the roof of the mouth and into the brain at the back part of the skull. When the brain is pierced, the bird gives a peculiar squawk, the feathers are loosened by a quivering of the muscles, and death is instantaneous. In dry picking, the feathers should be plucked immediately, and if the bird has been properly stuck they come out very easily. The tail and large wing feathers are removed first, after which the body feathers are pulled out.



FIGURE 14.—Driving turkeys to market (Glasgow, Ky.)

When the turkeys are to be marketed locally or shipped but a short distance they are cooled to a temperature of about 35° F. by hanging in the open air, provided the weather is cool enough; otherwise they are plunged into ice water and kept there until thoroughly cooled. After cooling they are packed undrawn in boxes or barrels. There is considerable risk for the producer, without proper refrigerating facilities, in shipping dressed turkeys long distances, as losses from improper cooling and from exposure to warm weather during transit are liable to occur. These losses may be reduced by packing the birds in barrels with cracked ice between layers and at each end of the barrel. A top layer of ice placed between two layers of burlap tacked securely over the top of the barrel is desirable. When turkeys are shipped a great distance in carload lots, they are usually cooled to 32° F., packed in boxes or barrels, and shipped in refrigerator cars.

Turkey feathers, when properly prepared, command good prices. Feathers from birds that have been scalded, however, are hardly

marketable, and the higher cost of dry picking is largely repaid by the value of the feathers. The feathers are used for various purposes, such as feather dusters, feather beds, and pillows. After the turkeys have been plucked, the feathers should be collected and thoroughly aired and dried. Separate the quill feathers from the others; sometimes it pays to separate the white feathers from the colored ones. The animal heat must be allowed to pass out, and the feathers should be quite dry. When they are spread out to dry they should be turned frequently. Be sure that all feathers are thoroughly cured and dry, after which they may be packed in strong burlap sacks for shipment to market.

THE IMPORTANCE OF SANITATION

Avoidance of parasites and prevention of disease should be the first aim of every turkey raiser. Good management will keep the flock free from parasites, and the selection of breeding stock having abundance of constitutional vigor will help materially in preventing disease. Turkeys should always be given the best possible surroundings. Provide free range on clean (sanitary) soil; provide wholesome feeds on clean soil, including plenty of green feed; give the stock good protection from dampness; keep the quarters strictly sanitary at all times; then, finally, breed for more constitutional vigor.

Of the infectious diseases among turkeys, blackhead is the most destructive, but it can be successfully controlled by proper sanitation. This disease first became serious in the New England States many years ago, and it is now found to a greater or less extent throughout most parts of the United States. Blackhead occasionally affects adult turkeys, but it occurs principally among young turkeys between the ages of 6 weeks and 4 months. As in the case of all other infectious diseases, to prevent further spread of the disease, the sick bird should be removed from the flock immediately and if very sick should be killed and the body burned. Clean out the roosting place and spread lime in places most frequented by the turkeys.

By all means possible prevent the introduction of blackhead into the flock, but if it once gets into the flock then do everything possible to prevent its spread. Several measures of prevention may always be taken as a precaution, the chief of which are: Obtaining eggs from flocks believed to be healthy; disinfecting the eggs to be incubated with a cloth soaked in an 85 per cent solution of grain alcohol; keeping the poults on ground at a distance from all chickens because chickens often carry the host of the blackhead organism; excluding, as far as possible, pigeons, sparrows, and animals from the turkey houses and yards; frequent disinfection of houses, feed troughs, and all other equipment; the immediate killing and burning of all affected birds. The feeding of sour milk has been found of advantage in keeping turkeys in good health and in reducing the activities of the organism causing blackhead. Clean range and care not to overfeed are most important. Blackhead is known to be transmitted by the cecum worm, and control measures for this worm and other parasitic worms are essential in the successful raising of turkeys. The treatment for blackhead and for worms is discussed in detail in Farmers' Bulletin No. 1652, Diseases and Parasites of Poultry.

CONTROLLING LICE

Lice are among the most important causes of the high mortality among young poults, those badly infested becoming gradually weaker and weaker until they die. Head lice cause most of the trouble and are found close to the skin near the top of the head, above and in front of the eyes, and under the throat. By applying an insect powder, such as sodium fluoride, when the hen is set, it is a very easy matter to prevent lice from getting a start among the poults. The sodium fluoride should be applied among the feathers next to the skin, one pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one at the base of the tail, one on each thigh, and one scattered on the underside of each wing when spread. If this is not done the poults are almost certain to have lice.

Poults should be examined for lice every few days, and if infected a small quantity of lard should be rubbed over the head and neck. Sodium fluoride may be used very sparingly on the poults if body lice are found, but should not be applied until the poults are at least a week old, and then only two very small pinches should be used. One of these should be distributed on the neck, top of head, and throat, and the other on the back and below the vent.

SUMMARY

To be successful in turkey raising, one must give the most careful consideration to certain fundamental factors. The turkeys, especially the growing stock, must be kept under the best possible conditions. Many have made a success in raising turkeys in semiconfinement. An abundance of free range on clean soil is greatly to be desired. Every effort should be made to keep the soil sweet and clean. This is particularly true of the soil on which the birds are fed and where they roost.

Another fundamental essential is to keep healthy and vigorous breeding stock in the best possible breeding condition. The breeders should get plenty of exercise and should not be fed too heavily on fattening rations. It is difficult to get stock that is free from blackhead, but one can at least select breeding stock based on constitutional vigor. By breeding from the most vigorous birds every year, a flock of healthy stock may be developed and maintained. Great care should be exercised in the selection of male breeders each year.

Both old and young turkeys should be protected from dampness. In sections of the country where dampness is prevalent or where rainstorms are frequent, the birds should be provided with suitable protection.

It is very important not to feed the poults too heavily, especially for the first few weeks. Keep them just a little hungry.

Watch the poults carefully for the appearance of lice and take every precaution to keep this pest in check.

So far as possible, remove the cause of any disease that may appear. Clean soil, sanitary quarters, and hygienic methods of feeding will do much to reduce mortality.

Success in turkey raising is largely a question of proper management.

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